

PEER REVIEW

To: City of Leavenworth Staff
From: Brad Lincoln, P.E.
Subject: Peer Review
Project: Leavenworth Adventure Park
GTC #18-292
Date: October 24, 2018



This letter is to provide a peer review to the City of Leavenworth for the Leavenworth Adventure Park TIA dated October 2018.

1. SITE EVALUATION AND ACCESS

GTC performed a site evaluation and confirmed the site description and existing roadways are consistent with the Leavenworth Adventure Park TIA. The Leavenworth Adventure Park TIA identifies that the site can meet Chelan County and ASHTO sight distance requirements to the south for a 35 mph posted speed limit and there is clear sight distance to US-2 intersection to the north. Channelization warrants at the site access are not included in the TIA.

1.1. Site Evaluation Comments

GTC has the following comments regarding the site evaluation and access:

1. A condition of approval should be ensuring there is adequate sight distance at the access location(s).
2. The WSDOT channelization warrants for left and right-turn channelization at the site access(es) should be provided

2. TRIP GENERATION

The trip generation documented in the Leavenworth Adventure Park TIA is based on the anticipated usage of the site, including data on the annual number of visitors to Leavenworth. Adjustments were made for the number of operating days, weather and other factors. The observations regarding the trip generation calculations are:

- GTC agrees ITE does not have a similar land use in the *Trip Generation Manual*, therefore an independent trip generation assessment is appropriate.
- The annual visitor estimate appears to have a reasonable correlation to the Market and Operation Assumptions identified in the overview for the most similar nationwide facilities and the Leavenworth market.
- GTC reviewed the detailed daily visitor generation for each operational day of the year. The seasonal weekday and Saturday peak daily visitor calculations appear reasonable if not conservatively high for the peak days used for analysis.
- The conversion of visitors to vehicular trips using average recreational carpool statistics is reasonable and an industry practice, which GTC has also used in the past. The data is also consistent with vehicle occupancy studies GTC has conducted locally.
- The hourly distribution of trips through the day using other recreational uses peak to daily K-factors is a reasonable methodology.
- Not including a reduction for walking, biking or bus/shuttle trips results in an overly conservative estimate of the trip generation. A reduction for other modal uses would be appropriate. The number of trips added to US-2 could be lower than what has been documented and analyzed in the report.

2.1. Trip Generation Comments

GTC does not have any comments that would increase the trip generation identified in the TIA. However, GTC does make the following suggestion:

1. Although not a requirement as part of the TIA approval, GTC suggests that a separate trip generation document be provided that clearly shows the steps in the trip generation calculations and assumptions to go from the visitor data to the final peak period trip generation values.

3. TRIP DISTRIBUTION

The trip distribution for the Leavenworth Adventure Park is based on the local counts and the fact that the site is on the westernmost edge of the developed area with no significant source of trip generation (hotels, residences, commercial, etc.) for over 50 miles to the west. Additionally, the trip distribution does not assume any trips will travel to or from the south along Icicle Road. The trip distribution therefore assumes 90% of the trips generated by the development will travel to and from the east along US-2 and 10% will travel to and from the west along US-2. GTC has the following observations regarding the trip distribution:

- The low percentage of trips traveling to and from the west along US-2 seems reasonable based on the land uses and existing splits of trips at the intersection of US-2 at Icicle Road. It is important to note that a sensitivity analysis was performed and doubling the trips to and from the west (i.e. 20%) would not significantly impact the operations of the intersection since it would change the trip assignments by approximately 10 trips.
- There are several hotels, residences and recreational activities south of the site along Icicle Road. Icicle Road carries 400 peak-hour trips (roughly 4,000 daily trips) and there is likely to be some percentage of trips generated by the development that will travel to and from the south along Icicle Road. There is also the potential for pass-by trips from Icicle Road. Not including these two factors results in a conservatively high estimate of the impacts of the development on the intersection of US-2 at Icicle Road.

3.1. Trip Distribution Comments

GTC does not have any recommended changes regarding the trip distribution for the Leavenworth Adventure Park.

4. TRIP TURNING MOVEMENTS

The counts utilized for the traffic analysis of the Leavenworth Adventure Park were obtained for the weekday PM peak-period and the Saturday peak-period in April 2018. A seasonal adjustment was then applied to these counts based on counts collected during the Labor Day weekend in September 2018. The future traffic volumes were calculated by using a 3.1% annually compounding growth rate and trips from the development. GTC has the following observations regarding the turning movement calculations:

- The City of Leavenworth Comprehensive Plan/Transportation Element and concurrency standards address typical weekday conditions. However, the City of Leavenworth and WSDOT requested peak season and Saturday analysis. The peak season and Saturday volumes are based on Labor Day weekend counts. This methodology is acceptable for identifying the peak season and Saturday volumes and should likely be considered overly conservative since they are based on a holiday weekend.
- These peak season and Saturday volumes do not follow the City of Leavenworth's concurrency evaluations standards for "typical" weekday volumes. However, they do evaluate the impacts of the development during a holiday weekend and are useful to fully disclose the impacts of the development during heavy traffic times.
- The 3.1% annually compounding growth rate results in over 16% growth for the 2023 Future Year conditions. This growth rate is significantly higher than WSDOT data in the area; which shows little to no growth in the area. Additionally, there are no significant developments planned in the area that would lead to additional growth.

GTC staff performed a count on Thursday, October 11, 2018 to compare the weekday traffic volumes utilized in the TIA. The counts were collected during the Octoberfest weekend. The total entering volumes were similar to the April counts

4.1. Traffic Volume Comments

GTC does not have any recommended changes to the traffic volumes. In fact, the traffic volumes represent higher volumes than a “typical” period that the City of Leavenworth Comprehensive Plan/Transportation Element would identify for concurrency evaluation. The traffic volumes in the TIA are therefore conservatively high.

5. LEVEL OF SERVICE ANALYSIS

The level of service analysis documented in the Leavenworth Adventure Park TIA uses standard HCS methodology. GTC reviewed the volumes, peak-hours and channelization utilized in the analysis and determined they are correct. GTC has the following observations regarding the level of service analysis:

- The reported level of service was completed on GTC software and was found to be the same as reported.
- The level of service analysis is likely overly conservative based on the previously identified conservative assumptions, including the holiday weekend volumes and trip calculations.
- The weekday peak-hour LOS C should be utilized for the concurrency evaluations based on the City of Leavenworth Comprehensive Plan/Transportation Element methodology. The LOS D during the Saturday peak, based on holiday weekend volumes, is good information for disclosure but not regulatory approval.

GTC staff also evaluated the queue lengths at the study intersection when the peak-hour counts were performed in October 2018. The observed queues had an average of 1 to 2 vehicles for the northbound right and westbound left-turn movements. The queues on these movements had a maximum queue of 4 to 5 vehicles that was observed two to three times during the peak-hour. These maximum queues cleared quickly and the vast majority of the time there was less than 1 vehicle queued. The northbound left-turn queue had no vehicles for the majority of the time with a maximum queue of 2 vehicles observed one to two times during the peak-hour. This is similar to what is identified in the TIA.

5.1. Level of Service Comments

GTC agrees with the level of service analysis documented in the Leavenworth Adventure Park TIA and does not have any recommended changes.

6. SIGNAL WARRANT ANALYSIS

GTC reviewed the signal warrant analysis for the intersection of US-2 at Icicle Road. GTC has the following observations regarding the signal warrant analysis:

- The signal warrant analysis follows the standard MUTCD requirements for signal evaluation.
- The results indicate that a signal would not be warranted for the intersection of US-2 at Icicle Road based on the volumes warrants using the future weekday volumes or Saturday volumes or based on the crash history.
- GTC's observations identified that westbound left-turn vehicles receive sufficient gaps based on platooning of eastbound traffic. Additionally, the northbound left-turn observed queue and Synchro analysis queue was no more than 2 vehicles during the weekday PM peak-hour. There were less than 3 pedestrian crossing movements observed during this time.

6.1. Signal Warrant Comments

GTC agrees with the signal warrant analysis performed as part of the Leavenworth Adventure Park TIA that a signal is not warranted. Additional observations completed by GTC staff did not provide any additional information to result in a signal being warranted.

7. COLLISION HISTORY

GTC reviewed the collision history data included in the Leavenworth Adventure Park TIA and concurs that the none of the study locations have a high collision history and there is no apparent existing safety issue.

8. MITIGATION

The City of Leavenworth does not have a traffic mitigation fee at this time. It should be noted that the Leavenworth Adventure Park development would only account for 6.6% (70 development trips of 1,065 total intersection trips) of the weekday PM peak-hour 2023 future trips at the intersection of US-2 at Icicle Road. The development would account for nearly the same percentage during the Saturday peak (6.5% based on 100 development trips and 1,550 total intersection trips).

8.1. Mitigation Recommendations

1. Field observations by GTC staff noted that eastbound traffic approaching Icicle Road is in the middle of transitioning from the higher west of Leavenworth to the urban 30 mph. Additional signage, such as a speed feedback sign, may be warranted to alert drivers of the reduced speed limit before the Icicle Road intersection.

9. SUMMARY

The Leavenworth Adventure Park TIA has been conducted using standard traffic engineering practices and standards for the weekday evaluation required for City of Leavenworth concurrency determination. The TIA has also conducted a conservative evaluation of seasonal peak activity. The seasonal peak trip generation assumptions are very conservative for a “worst case” evaluation of the Saturday peak conditions. Neither the standard weekday nor the Saturday conditions showed a deficient level of service or a signal being warranted.

Lilith Vespier

From: Brad <Bradl@gibsontraffic.com>
Sent: Thursday, October 25, 2018 4:09 PM
To: John Sutherland
Cc: Edward
Subject: Sight Distance Question

John:

I don't think moving the sight distance will necessitate a change to our review memo. The review memo essentially says sight distance will need to be met at the access(es).

Brad Lincoln, PE

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